BARIX
THE VOICE OF SIMPLICITY

# User Manual

## Instreamer

Network audio encoder for
commercial, industrial and
security applications

Firmware V4.01
Released 4th May 2011
Supports:

- INSTREAMER (legacy)
- INSTREAMER 100
- EXSTREAMER 1000, 500
- ANNUNCICOM series

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# 1 Introduction

## 1.1 About the “Instreamer ” firmware

The “Instreamer ” firmware is designed to serve as a versatile, network-enabled analog and digital audio-to-Ethernet converter for commercial audio distribution.

The “Instreamer ” firmware converts audio from any analog or digital device into G.711 (8 bit), PCM (16 bit) or high-quality MP3 streams. The audio is encoded in real-time, and the generated audio stream can be distributed, via an IP-based network or the Internet, to one or more receivers or Shoutcast / Icecast-servers.

Barix devices running the “Instreamer ” firmware can be easily managed via a web browser interface using PCs, web pads, PDAs or other web-enabled devices. SNMP remote monitoring capabilities allow for building a manageable distributed audio network. With serial and Ethernet control APIs, open IP-standards, and the standard encoding formats, the device can also be integrated with other components, controlled by automation systems, or used with Barix Exstreamers to create more flexible, more cost-effective distributed audio systems.

The built-in serial interface allows data to be relayed to another Barix device, a PC or a server using the “Serial Gateway” functionality of the “Instreamer ” firmware.

With an optional stick-on transmitter, additional IR-enabled devices can be remote controlled via the network connection, enabling users to control their audio sources without being in the same location as the device.

## 1.2 Features

- Generates MP3 streams at adjustable bit rates (VBR) from analog or digital (optical/coaxial S/P DIF) sources
- Generates G.711 (aLaw/uLaw) streams at 8 or 24 kHz sample rate from an analog source
- Generates aLaw/uLaw streams at 12 or 32 kHz sample rate from an analog source
- Generates PCM (16 bit) streams at 8,12,24,32 kHz sample rate, mono big or littel endian and 44.1 kHz sample rate mono big endian from an analog source
- Generates PCM (16 bit) streams at 44.1 and 48 kHz sample rate, stereo big or littel endian from an analog source.
- Supported stream connections: HTTP, BRTP, RTP, SIP, Raw UDP, Raw TCP, Icecast and Icecast ID3 source, Shoutcast source
- Supports stream authentication (HTTP, Shoutcast, Icecast)
- 10/100 Mbit Ethernet connection supports automatic network configuration (BOOTP, DHCP, AutoIP and IPzator) as well as manual static IP configuration
- Features SonicIP ® announcing the IP address on power up over the audio outputs
- Control and configuration using a standard web browser
- Remote monitoring using SNMP
- Remote controllable using HTTP, TCP and UDP

- Supports IR remote control command relaying (Network to IR out).
- Supports Serial Port relaying (Serial gateway over Network)
- New V3.17. Supports all General Purpose Inputs (GPIs) on the Exstreamer 1000, Exstreamer 500 and Annuncicom 1000. The Inputs are used either to trigger streaming or to send contact closures to a partner device with SW loaded capable of decoding the information. (e.g. Streaming Client V2.10 or later).

## 1.3 Installing the device

For the installation of the Barix Instreamer 100 or the legacy Barix Instreamer please refer to the corresponding “Quick Install Guide”.
A printed version is included in the box and can also be downloaded from our site www.barix.com.

## 1.4 Additional documents

Technical specifications can be found in the corresponding product sheet which can be downloaded from our site www.barix.com.

For detailed technical information about the CGI application programming interface (API) please download the “Instreamer Technical Documentation” from our website.

## 1.5 Preloaded Firmware

Barix preloads the Instreamer 100 with the “Instreamer” firmware version. If other HW is being used then the factory firmware will have to be replaced.

Before continuing with this manual make sure that the firmware version is up to date and corresponds with this manual. Please proceed to chapter 6 Updating the device in order to do so.

## 1.6 About this manual

### Links to chapters

References to chapters (e.g. X Chapter name) are red and underlined and serve as direct links when viewed in Adobe Acrobat Viewer. Click on the link to jump to the referenced chapter, click on the left arrow icon to jump back to where you came from.

### Links to the Dictionary

Some technical terms (e.g. DHCP) are underlined and red. Click on them to jump to the dictionary at the end of this manual, click on the left arrow icon to jump back.

### Bookmarks pane in Adobe Acrobat

The complete “Table of Contents” is available in Adobe Acrobat Viewer. Click on the “Bookmarks” pane tab on the left side of Adobe Acrobat Viewer to open it. Click on any bookmark to directly jump to the corresponding part of the manual.

### Chapter overview

This manual is divided into the following chapters:

- Device Configuration (explaining all configuration parameters)

- Updating the Firmware (explaining how to update or how to change from “standard firmware”)
- Step by step “How To” (explaining configuration for external services and devices)
- IR Remote control (explaining the functionality of the Barix IR Remote control)
- Advanced User section (explaining configuration via Serial cable and reference to the CGI API)
- Dictionary (explaining technical names and expressions used in this manual)

# 2 Device Status and Control

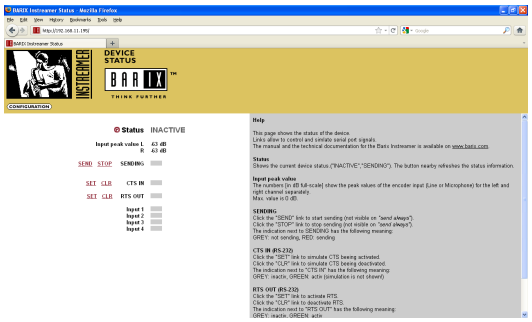
To view the current status and control it using the Web interface you will need:

- the IP address announced over the audio outputs (see the Quick Install Guide)
- a standard web browser

Open your web browser and type in the IP address of the Barix device in the URL field and hit the “Enter” key.

- Example: “192.168.0.12”

You will see the following window content:




The top frame shows the logos “INSTREAMER” and “BARIX”. A click on either logo will bring you to the Barix homepage.

Help information will show up in the right, grey frame of the browser window.

The left white frame shows current status information and permits the control of the streaming status, the simulation of the CTS input signal and the control of the RTS output. For details see the section below.

## 2.1 Status and Control

### Refresh

The status frame page is refreshed every couple of seconds. To refresh it on demand click the reload button left of the word “Status”.

### Status

Shows the current status "INACTIVE" or "SENDING".

### Input peak value

The numbers [in dB full-scale] show the peak values of the encoder input (Line or Microphone) for the left and right channel separately.
Maximum value is 0 dB.

### SENDING

The LED next to SENDING has the following meaning:
GREY for not sending, GREEN for sending
When the device is set to “send on CTS” then the following two links will appear:
Click the "SEND" link to start sending the stream.
Click the "STOP" link to stop sending.

### CTS IN (RS-232)

Click the "SET" link to simulate CTS being activated.
Click the "CLR" link to simulate CTS being deactivated.
The LED next to "CTS IN" shows the status of the physical CTS signal (the simulation is not shown!) and has the following meaning:
GREY for inactivated, GREEN for activated

### RTS OUT (RS-232)

Click the "SET" link to activate the RTS output.
Click the "CLR" link to deactivate the RTS output.
The LED next to "RTS OUT" has the following meaning:
GREY for inactivated, GREEN for activated.

### Inputs

Inputs 1-4 are available on an Exstreamer 1000 or 500, inputs 1-8 are available on an Annuncicom 1000.
GREY is shown for an inactive and GREEN for an active GP input.

# 3 Device Configuration

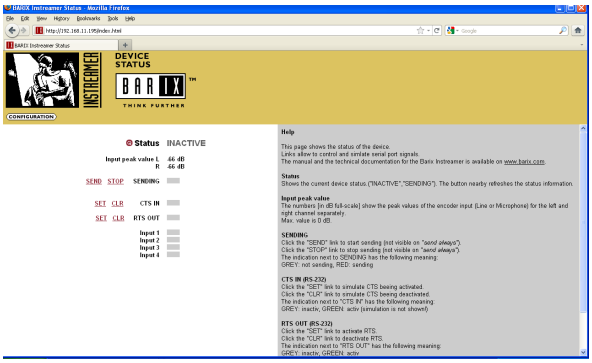
You can adjust network settings, streaming destinations, monitoring settings and more with the Web interface. To enter the configuration mode you will need:

- the IP address announced over the audio outputs (see the Quick Install Guide)
- a standard web browser

Open your web browser and type in the IP address of the Barix device in the URL field and hit the “Enter” key.

- Example: “192.168.0.10”

You will see the following window content:




The top frame shows the logos “INSTREAMER” and “BARIX”. A click on either logo will bring you to the Barix homepage.

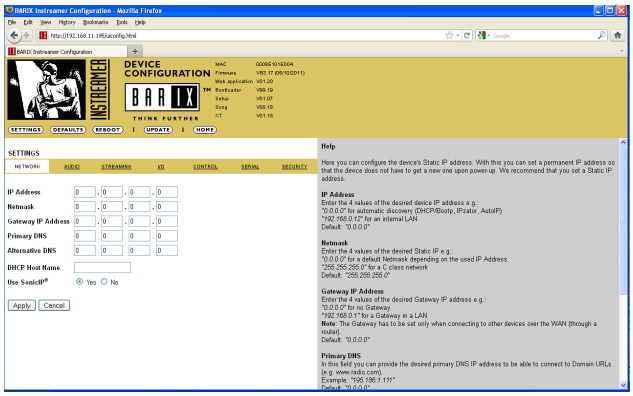
Help information will show up in the right, grey frame of the browser window.

To obtain the configuration pages click the CONFIGURATION button below the Instreamer graphic.

New from V3.17. Press the “LISTEN” button to open the radio playlist file instreamer.m3u

## 3.1 Network settings

This chapter explains how to adjust the network settings of the Barix device.




We recommend that you set a Static IP address. With a static (permanent) IP address the device

does not have to get a new IP address at power on or reboot.

### IP Address

Enter the 4 values of the desired static IP address e.g.:

- “192.168.0.12” for an internal LAN

**Attention**: Make sure that you enter a free IP address. The device will check this and will not be available until the device using the same IP is disconnected or switched off. The command Ping can be used to ensure that a specific IP address is unused (i.e. No reply).

The automatic discovery functions are not executed if a Static IP address is set.

The automatic options are as follow:

- “0.0.0.0” for automatic discovery (Discovery order: BOOTP, DHCP, IPzator, AutoIP)

To enable automatic discovery but disable certain IP discovery functions set all but the third value to zero.
For each function you want to disable add the value from the table below:

- “0.0.1.0” to disable AutoIP
- “0.0.2.0” to disable DHCP
- “0.0.4.0” to disable BOOTP
- “0.0.8.0” to disable IPzator

Examples:

- “0.0.3.0” disables AutoIP and DHCP
- “0.0.11.0” disables all but BOOTP

**Attention**: “0.0.15.0” disables all discovery functions which locks you out unless you reset the device to factory defaults by pressing the reset button for about 10 seconds.

### Netmask

Enter the 4 values of the desired Netmask e.g.:

- “0.0.0.0” for a default Netmask depending on the IP Address used
- “255.255.255.0” for a C class network

**Note**: Try first the Netmask your PC is set to or ask your Network Administrator.

### Gateway IP Address

A correct setting of the Gateway IP address is needed to stream to the Internet or to destinations outside your local network (LAN).
Enter the 4 values of the desired Gateway IP address e.g.:

- "0.0.0.0" for no Gateway or automatic discovery
- "192.168.0.1" for a Gateway in a LAN

**Note**: If you have set the devices IP address to automatic discovery and your server or router has issued an IP address then most probably it also has supplied a valid Gateway address, “0.0.0.0” will then work fine.

If you have set a SonicIP address then you will need to configure a valid Gateway address manually. Try first the same Gateway IP address your PC is set to. If it doesn’t work then ask your Network Administrator for a correct Gateway IP address.

### Primary/Alternative DNS

In these fields you can provide DNS IP addresses which are used to resolve URLs, e.g. www.radio.com

### DHCP Host Name

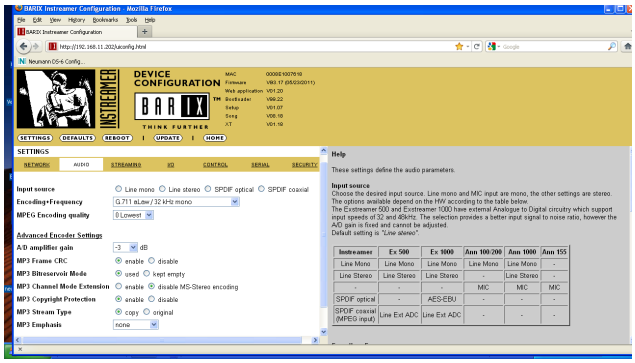
From version VB3.17 a DHCP host name can be configured for the device. If this field is left blank then the device creates a DHCP name using part of the Ethernet MAC address e.g.“CO1ED04” where ED04 are the 2 least significat bytes of the MAC.

### Use SonicIP

If “Use SonicIP” is set to yes, the device will announce its IP address over the audio output during start up.

## 3.2 Audio settings

This chapter explains how to adjust the audio input and output settings of the Barix device.




### Input source

Choose the desired input source. Line mono and MIC input are mono, the other settings are stereo.
The options available depend on the HW according to the table below. The Exstreamer 500 and

Exstreamer 1000 have external Analogue to Digital circuitry which support input speeds of 32 and 48kHz. The selection provides a better input signal to noise ratio, however the A/D gain is fixed and cannot be adjusted. Default setting is "Line stereo".

| **Instreamer** | **Ex 500** | **Ex 1000** | **Ann 100/200** | **Ann 1000** | **Ann 155** |
|---|---|---|---|---|---|
| Line Mono | Line Mono | Line Mono | Line Mono | Line Mono | - |
| Line Stereo | Line Stereo | Line Stereo | - | Line Stereo | - |
| - | - | - | MIC | MIC | MIC |
| SPDIF optical | - | AES-EBU | - | - | - |
| SPDIF coaxial (MPEG input) | Line Ext ADC | Line Ext ADC | - | - | - |

### Encoding & Frequency

Choose between six different MP3, 8 G.711 and 13 PCM encoding settings. The bit rate used for 8 and 24kHz G.711 and PCM is displayed in kbit/sec. in the table below.

| Encoding / Sampling freq. | 8 kHz | 24 kHz |
|---|---|---|
| G.711 8bit (uLaw or aLaw) | 64 | 192 |
| PCM 16bit | 128 | 384 |

For MP3 average bit rates see the next section.

**Note:** In case of S/PDIF input, if MPEG1 is used the sampling frequency is auto detected (32, 44.1 or 48 kHz). For uncompressed formats the sampling frequency must be set to match the input, the coding type does not matter.

### Encoding Quality

This parameter applies only when MPEG encoding is selected in the previous parameter. Choose between "0 lowest" and "7 highest" in steps of 1. The encoder quality table below shows the average bit rate in kilobits per second for the quality settings and sampling frequencies in kHz using mono input with MS-Stereo encoding disabled.

| Encod./Quality | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| MPEG1 48kHz | 72 | 76 | 80 | 88 | 96 | 112 | 144 | 160 |
| MPEG1 44.1kHz | 65 | 68 | 73 | 80 | 90 | 105 | 125 | 140 |
| MPEG1 32kHz | 52 | 56 | 64 | 72 | 80 | 96 | 112 | 136 |
| MPEG2 24kHz | 38 | 44 | 48 | 52 | 60 | 80 | 96 | 112 |
| MPEG2 22.05kHz | 35 | 38 | 40 | 45 | 50 | 60 | 75 | 90 |
| MPEG2 16kHz | 28 | 30 | 34 | 40 | 44 | 48 | 56 | 64 |

The encoder quality table below shows the average bit rate in kbit/s (kilobits per second) for the quality settings and sampling frequencies in kHz using stereo inputs.

| Encod./Quality | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| MPEG1 48kHz | 88 | 96 | 104 | 120 | 144 | 160 | 176 | 192 |
| MPEG2 16kHz | 35 | 38 | 44 | 48 | 56 | 64 | 80 | 96 |

The above table shows only the average bit rates for 16 kHz and for 48 kHz. As the “stereo” adds about 20 to 30 percent when compared to “mono” other sampling frequencies can be calculated using the previous “mono” table.

#### Advanced Encoder Settings

These following settings are for advanced users only. Detailed information about the Encoder Settings can be found in the Micronas MAS3587 MP3 encoder data sheet.

#### A/D amplifier gain

Choose the desired gain (“-3” up to “19.5” dB) for the line input A/D amplifier.
**Note:** The line input sensitivity has changed from 2 Volts peek to peek on legacy devices to 4 Volts peek to peek on the new “Instreamer 100” (less sensitive).

#### MP3 Frame CRC

If set to “enable”, the encoder will include the CRC-16 in each MP3 frame.

#### MP3 Bitreservoir Mode

The “Bitreservoir” is used to compensate the differences between the predefined frame sizes. If set to “used”, the encoder will use the bitreservoir. Leave the setting to “kept empty” if you use RTP streaming or need low latency on the transmission.

#### MP3 Channel Mode Extension

“Enable” or “disable” the MS-Stereo encoding (for stereo only). When set to “disable MS-Stereo encoding” only mono will be encoded and therefore the bandwidth used is minimized.

#### MP3 Copyright Protection

“Enable” or “disable” the copyright protection bit in the MP3 stream.

#### MP3 Stream Type

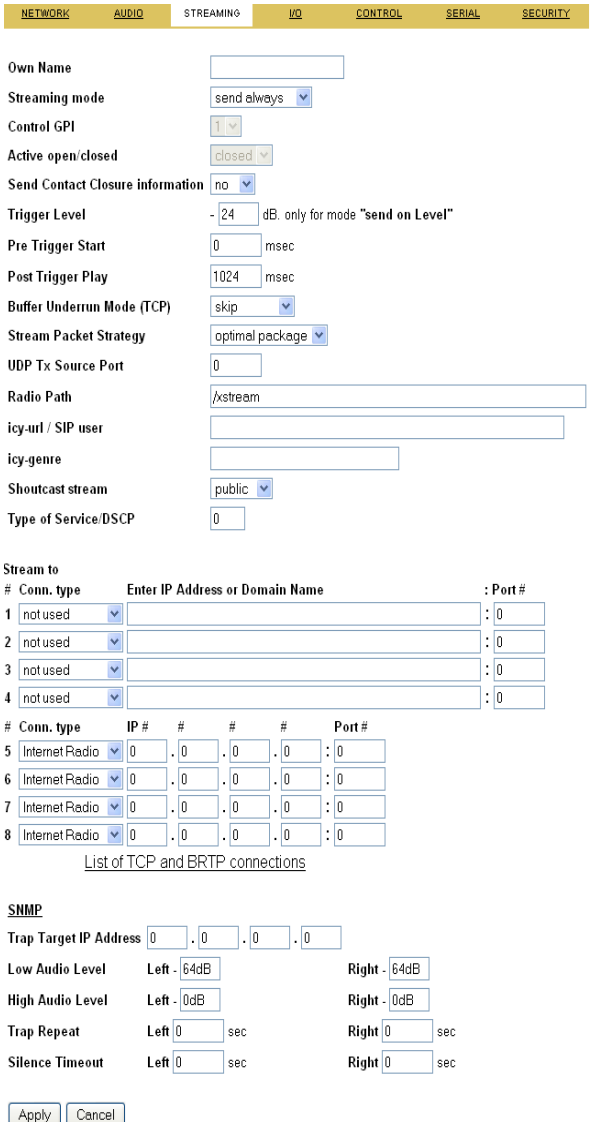
Select between a “copy” or an “original” in order to set the appropriate bit in the MP3 stream.

#### MP3 Emphasis

Select emphasis “none”, “50/15 us” or “CCITT J.17”.

### 3.3 Streaming settings

These settings adjust the streaming mode, parameters and destinations.




### Own Name

You can enter the name of the Barix Instreamer here. This name will be returned when using the DISCOVER command (see technical documentation).

### Streaming mode

Streaming is started depending on the selected operating mode:

- send always will stream always
- send on CTS will stream if the SEND button (command) is pressed or CTS (Pin 8 Serial connector) is connected to a positive supply (9VDC, Pin 4 Serial connector)
- send on Level will stream if the incoming analogue audio signal is above the Trigger level (see section below). This feature is not available for digital inputs.
- send on I/O (only available on devices with GPI) will stream audio depending

upon the state of the GPI configured as the Control GPI

**Control GPI**

Defines which GPI will control the streaming if the streaming mode is “send on I/O”.

**Active open/closed**

Defines whether the device streams when the selected Control GPI is in the open or closed state.

**Send Contact Closure Information**

The current state of the device's GPI is inserted into RTP and Shoutcast streams. (This also applies to the BRTP connection type which uses an RTP stream). This feature is compatible with Streaming Client v02.10 and later.

**Trigger level**

The Trigger level is only used when Streaming mode is set to send on Level.
Select a value between 0 and 32767.
Open the Device status page and look for the Input peak
value to get a hint for the trigger value. This page refreshes itself every few seconds.

**Pre Trigger Start**

Pre Trigger Start can be adjusted to prevent a cut off when audio should be sent earlier than detected. It defines the amount of time that will be streamed before the actual trigger occurred. This feature is most useful when used in combination with the send on level feature.

**Post Trigger Play**

Post Trigger Play can be adjusted to prevent a cut off when audio should be sent longer than detected. It defines the amount of time that the device will continue streaming after the actual trigger has been cleared. This feature is most useful when used in combination with the send on level feature.

**Buffer Underrun Mode (TCP)**

The Buffer Underrun Mode (TCP) defines the action if a TCP stream is slower than the real stream from the encoder. In this case the output streaming buffer underruns and cannot hold older data any more. The device can then “disconnect” the TCP connection or it can ”skip” the stream directly to the encoder stream without disconnecting TCP.

**Streaming Packet Strategy**

The Streaming Strategy defines how a packet is build and sent. On “lowest latency” the encoded data will be sent directly after the encoding. On “optimal package” the packet will be filled up before sending.

**UDP Tx Source Port**

This setting is only used with a custom software application. Enter the used source port number for a UDP stream (between 0 and 65535). When set to 0 the source port is set to the same port as selected in the destination port (in section Stream to). If destination isset to “origin source” the UDP

Receiver Port is used.

**Radio Path**

Enter a radio path to listen to the transmitted stream of this Barix Instreamer using a device that is able to play MP3 radio stations (also PC software like WinAmp).
The URL to connect is **http://x.x.x.x/p** where **x.x.x.x** is the IP address of this device and **/p** is this Radio path.
Example: **http://192.168.0.24/xstream**
The device can serve up to 6 concurrent radio streams

**icy-url / SIP user**

"icy-url" is taken into account only for Shoutcast. Enter URL of web of your radio station (up to 60 characters).
Example: "**http://www.exampleradio.com**"
Default setting is empty.
SIP user is the user name that will be called on the target SIP device (SIP server or SIP phone)
Example: "**betty**" calls "**betty@192.168.2.21**"

**icy-genre**

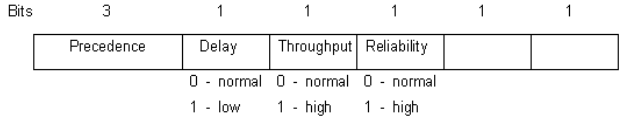
Genre of streamed music (icy-genre header). Taken into account only for connection when "Shoutcast source stream" type is selected.
Default setting is empty .

**Shoutcast stream**

Select if the stream is private or public (icy-public header). Taken into account only for connection with Shoutcast source stream type selected.
Default setting is "public".

**Type of Service/DSCP**

This field uses 6 bits (bit 2-7) only, bit 0-1 not used.
The following diagram illustrates the TOS field in detail:




**TOS Field Precedence**

The following list details the precedence bits and their possible values:

- 000 (0) - Routine
- 001 (1) - Priority
- 010 (2) - Immediate
- 011 (3) - Flash
- 100 (4) - Flash Override
- 01 (5) - Critical
- 110 (6) - Internetwork Control
- 111 (7) - Network Control

Now the TOS bits themselves:

- Delay - when set to '1' the packet requests low delay.
- Throughout - when set to '1' the packet requests high throughput.
- Reliability - when set to '1' the packet requests high reliability.

**DSCP**

DiffServ introduces the concept of the DiffServ Code Point (DSCP) that uses the first 6 bits of the TOS field thereby giving 2^6 = 64 different values
The following table illustrates the DSCP values:

| Per Hop Behaviour (PHB) | | | DiffServ Code Point (DSCP) | | IP Precedence |
|---|---|---|---|---|---|
| **Default** | | | | | 0 |
| | | **000**000 | | | |
| **Assured Forwarding** | | **Low Drop Probability** | **Medium Drop Probability** | **High Drop Probability** | |
| | Class 1 | AF11 | AF12 | AF13 | 1 |
| | | **001**010 | **001**100 | **001**110 | |
| | Class 2 | AF21 | AF22 | AF23 | 2 |
| | | **010**010 | **010**100 | **010**110 | |
| | Class 3 | AF31 | AF32 | AF33 | 3 |
| | | **011**010 | **011**100 | **011**110 | |
| | Class 4 | AF41 | AF42 | AF43 | 4 |
| | | **100**010 | **100**100 | **100**110 | |
| **Expedited Forwarding** | | EF | | | 5 |
| | | **101**110 | | | |

## Stream to

There are up to 8 destinations to stream to. Each one can be directed to a device, or a multi- or broadcast address (destination connection types) or be set up as a listener waiting for a connection to be initiated by the other side (listener connection types). Each entry has its own IP address and Port. See the following sections on how to set the “Stream to” entries.

**Stream to Considerations**
The choice of settings to distribute the stream to other devices depends on your environment and desired functionality.

If the stream should be reliably received by just a few devices (up to 8) “raw TCP” can be used since lost packets are retransmitted automatically. If you encounter too many audio blanks (hiccups) then we recommend using RTP since lost packets are replaced by the “Streaming client” firmware in the receiving “Exstreamer” device. This type is to be favored when the stream has to pass a number of routers (WAN or Internet) as RTP is resilient to packet delays.

If the stream is intended to be received by many devices we recommend to use UDP broadcast as long as all devices are on the LAN as a broadcast is no able to pass over a WAN.

If your receivers are behind routers using NAT (network address translation) we recommend to use BRTP which can use port 80 and no change to the router is required. Only the router on the “Instreamer” side has to have an open port 80 forwarding requests to the “Instreamer”.

If your network infrastructure is capable of multicasting use multicast (instead of multiple unicasts) to reduce the traffic generated.

A mix of all the above is possible as each of the 8 destinations allow the individual choice of the

connection type (except for the types “BRTP” and “SIP” which are only available with the first entry).

**Stream to Disabled entry**

Set the connection type to “not used” to disable an entry. The IP and Port can be left as is as they are as they do not matter on a disabled entry.

**Stream to Internet Radio entry**

Set the connection type to “Internet Radio” radio server for a single client (default). The IP “0.0.0.0” will act as a TCP listener (HTTP) waiting for a connection on the port selected under “Port#” (0=80). See also section Radio Path for additional configuration details.
**Limitation:** Even though eight entries can be configured only six concurrent radio servers are supported.

**Stream to RTP entry**

Set the connection type to “RTP” (Real Time Protocol) for an RTP destination. The IP “0.0.0.0” will broadcast (UDP) on the subnet (e.g. "192.168.0.255") on the port selected under “Port#” (e.g. 4040), enter an IP for a UDP unicast destination (e.g. “192.168.0.11).

**Stream to BRTP entry**

Set the connection type to “BRTP” (Barix Real Time Protocol) for a BRTP server (up to 32 clients). The IP “0.0.0.0” will act as a BRTP listener (UDP) waiting for BRTP clients requesting a stream on the port selected under “Port#” (e.g. 80).

**Stream to SIP entry**

SIP is only available with the first entry.
Set the connection type to “SIP” for an asterisk SIP server destination. Enter the IP of the SIP server. SIP works only when either “u-Law 8kHz” or “a-Law 8kHz” encoding is selected. Enter the UDP port of the SIP server under “Port#” (Port 0=5060).
See also section icy-url / SIP user further above.

**Stream to Raw UDP entry**

Set the connection type to “Raw UDP” for an UDP destination. The IP “0.0.0.0” will broadcast (UDP) on the subnet (e.g. "192.168.0.255") on the port selected under “Port#” (0=3030), enter an IP for a UDP unicast destination (e.g. “192.168.0.11).

**Stream to Raw TCP entry**

Set the connection type to “Raw TCP” for a single TCP client. The IP “0.0.0.0” will act as a TCP listener waiting for a connection on the port selected under “Port#” (0=2020).

**Stream to Icecast source entry**

Set the connection type to Icecast source to connect (TCP) to a single Icecast server. Enter IP and port of the Icecast server for the device to act as an Icecast source. When authentication is needed please read also section Ice/Shoutcast (Security settings).

**Stream to Shoutcast source entry**

Set the connection type to “Shoutcast source” to connect (TCP) to a single Shoutcast server. Enter IP and port of the Shoutcast server for the device to act as a Shoutcast source. When authentication is needed please read also section Ice/Shoutcast (Security settings).
The IP “0.0.0.0” will let the Instreamer act as a Shoutcast server itself waiting for a connection on the port selected under “Port#”. The function is then limited to a single client (a media player like Winamp) and only one entry is allowed to be set to Shoutcast server (IP 0.0.0.0).

**IP Address**

Enter 4 values of the destination IP address e.g.:
"0.0.0.0" for unused destinations (except when the connection type is set to UDP it will be broadcasted e.g. "192.168.0.255").
"0.0.0.0" for connection TCP + Port if this device is used as a TCP listener waiting for a connection from a streaming device. (default)
"192.168.0.34" for a directed connection
"192.168.0.255" for a broadcast
Default settings for the first entry is "RTP 0.0.0.0:4444".
Default settings for other entries is "Internet Radio 0.0.0.0:0".

**Domain Name**

If an active connection is required within the first 4 entries, a Domain Name or an IP address can be provided. An example of a Domain Name is www.myserver.com. If an IP address is provided, e.g. 192.168.0.34, then this is used, otherwise the device attempts to obtain the IP address from a Domain Name Server.

**Port #**

Enter the port number for each destination (between 0 and 65535). If this port is set to 0 then the default ports are used (Internet Radio 80, TCP 2020, UDP 3030). For Shoutcast, enter the base port (the lower one, the same as clients put into their radio players).

**SNMP settings**

SNMP settings are located in the streaming section and are for advanced users only. Different SNMP traps can be generated depending on the state of the Barix Instreamer. The traps are triggered according to specific audio values as described below. Note that audio levels can only be monitored for analogue audio inputs.

**Trap Target IP Address**

Enter the IP address of the SNMP trap destination.

**Low Audio Level**

Define the low audio level for the trap which will be generated as soon as the audio level goes below this value (and the “Silence timeout” has expired).

**High Audio Level**

Define the high audio level for the trap which will be generated as soon as the audio level goes above this value.

### Trap Repeat

Define the SNMP trap repeat interval. The trap is repeated if the audio level values are still out of range.

### Silence Timeout

Define the time interval for sending a trap after the low audio level is detected.

## 3.4 I/O Settings

Configure which of the commands below should be issued when the CTS signal on the serial connector is activated

### CTS close command

Configures which command should be issued when the CTS signal on the serial connector is activated

### CTS open command

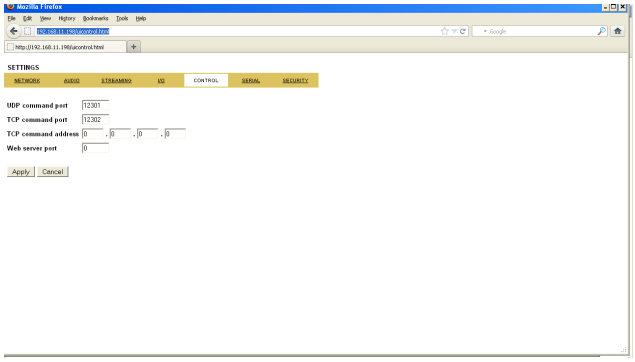
Configures which command should be issued when the CTS signal on the serial connector is deactivated

### Commands

Commands can be joined using the “&” character and will be executed sequentially. For further commands refer to the “Instreamer technical documentation”.
SENDING MODE
c=84 : Deactivate the sending mode, if not send always
c=91 : Activate the sending mode
SERIAL
c=89 : Simulate the CTS Signal being activated
c=90 : Simulate the CTS Signal being deactivated
c=60 : Activate the RTS Signal
c=61 : Deactivate the RTS Signal

## 3.5 Control settings

These settings adjust the control port properties.




### UDP command port

Defines the port where the device will receive commands via UDP. To disable set this port number to “0”.

### TCP command port

Defines the port where the device will receive commands via TCP. To disable set this port number to “0”.

### TCP command address

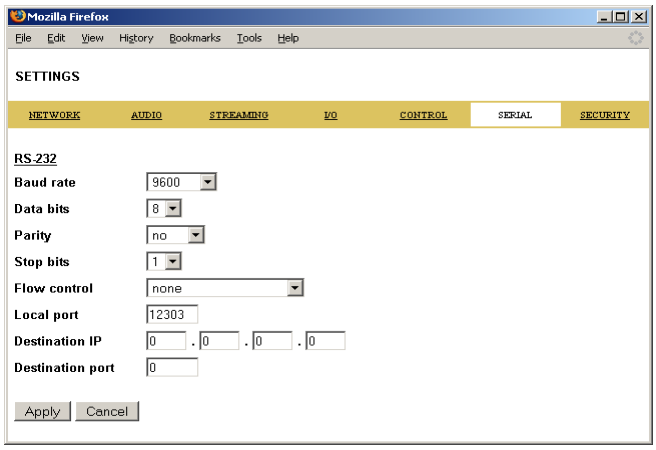
If 0.0.0.0, a listening command port is opened. Otherwise a TCP connection is actively attempted at the given address and port. If the connection fails, it is reattempted every minute. Default:*0.0.0.0*

### Web server port

Defines the port on which the web server of the Barix Instreamer can be reached. If set to "0" the default HTTP port 80 is used.

## 3.6 Serial settings

These settings adjust the serial port, local port and serial gateway properties.



**Baud rate**

Select the serial transmission speed from “300” to “115200” Baud (bits per second).

**Data bits**

Select “7” or “8” data bits.

**Parity**

Select “no”, “even” or “odd” parity.

**Stop bits**

Select “1” or “2” stop bits.

**Flow control**

Select the type of flow control: “none”, “Software (XON/XOFF)” or “Hardware (RTS/CTS)”.

**Local port**

Defines the port on which the serial port can be accessed for serial gateway application. Only when “Local port” is set to "0" the serial port can be used as a command interface.
If the active serial gateway is enabled and the "Local port" is set to a value then this will be the source port of the TCP connection. On "0" a random source port is used.

**Destination IP**

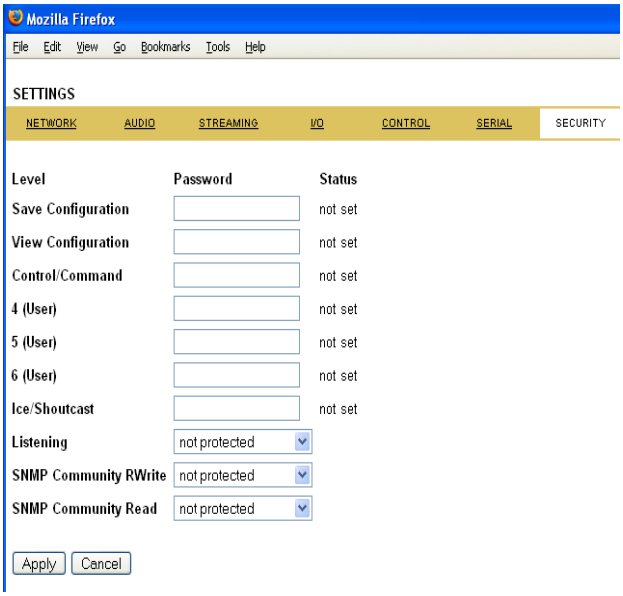
To have this device actively establish a serial gateway select the destination IP address to the device where the serial data will be transmitted to (and received from).
Select "0.0.0.0" when the serial port is used only locally.

**Destination port**

Defines the port for the active serial gateway function (see destination IP).
**Notes:** Both settings, "Destination IP" and "Destination port" have to be set to enable the gateway function. When the Serial Gateway is activated the serial port cannot be used as a command interface. This also applies for the device on the other side of the "Serial Gateway".
To establish a "Serial Gateway" between two devices only one device has to be activated. In other words: Only one device will need a Gateway destination IP and Port set. The other side only needs the parameter “Local port” to be set to the same value as the above “Destination port”. On power up the active device connects to the selected device and tries to reconnect automatically if the connection is lost. This allows the establishment of a serial connection between the attached devices on each side, over a LAN or WAN.

## 3.7 Security settings

These settings can be used to secure the access to the device on different levels. The status is shown next to each password (set or not set). Access is free for levels without a password (default setting).




### Save configuration

Enter up to 24 characters to secure the saving of the device configuration (Clicking the “Apply” button). Without a valid password the device configuration cannot be saved! Enter 25 characters to erase the current key.

### Save configuration password usage

When the password is set the user has to type in the password in the “Save Config Password field” before hitting the “Apply” button.

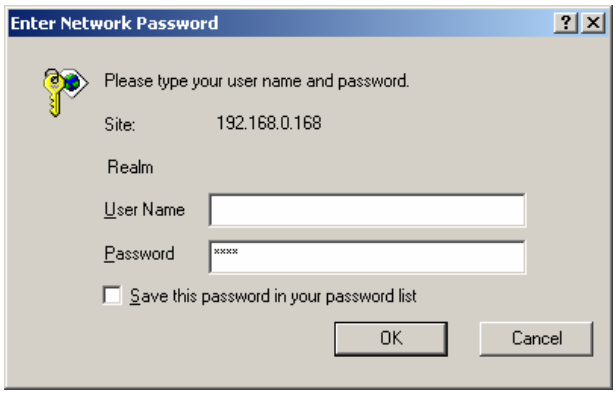
Without a valid password a warning will be displayed and the changes will not be saved.

### View configuration

Enter up to 24 characters to secure the viewing of the device configuration (Clicking the “Config” button).
Without a valid password the device configuration cannot be viewed! Enter 25 characters to erase the current key.

### View configuration password usage

When the password is set the user clicking on the “Config” button has to type in the password into the password field of the pop up window (the user name does not matter).




Only one user can log in at a time. Further connections will be refused while one user is logged in.

To log out click on the “Logout” link next to the “HOME” icon in the menu bar.

Please hit your browser’s “Reload” button if the “Logout” link is not visible while logged in.

### Control / Command

Enter up to 24 characters to secure the access to all control and command interfaces (WEB/CGI, Serial, TCP and UDP). Without a valid password the device cannot be controlled. Enter 25 characters to erase the current key.

**Note :** This security option should be used very carefully and is intended for advanced users only. Since the CGI commands used in the web interface do not make use of passwords, setting this password would disable any control of the device using a browser.

### Level 4 to 6 (User)

Enter up to 24 characters to secure the access to customized web pages in 3 levels. Intended for advanced users only, for details see the “Instreamer Technical Documentation”. Without a valid password these user web pages cannot be viewed. Enter 25 characters to erase the current key.

### Ice/Shoutcast

Enter up to 24 characters for Icecast or Shoutcast server authentication. This password is only used when one or more “Stream to” entries are set either to “Icecast source”, “Icecast / ID3 source”or “Shoutcast source”. Enter 25 characters to erase the current key.

### Listening

Choose which level is used for preventing unauthorized listeners from listening to Instreamer in Internet Radio mode, or "not protected" for access for all.

#### SNMP Community Rwrite

Choose a password for the Read and Write Community, or "not protected" to ignore both the read and write communities or "no write access"

#### SNMP Community Read

Choose a password for the Read Community, or "not protected" to ignore the read community or "no access"
Note that the Community RWrite setting takes priority. This means that if the Community RWrite is set to not protected, Community Read is ignored.

## 3.8 Additional Features

From V3.17 two xml files are added to provide a LiveFeed Service for Cisco's Call Manager.
For the Call Manager settings please refer to the relevant Cisco documentation. The Service URL to configure is:
http://<Instreamer IP address>/livefeed.xml.
So in the example below this would be:
http://192.168.11.171/livefeed.xml.

#### livefeed.xml

To use this feature configure the Instreamer 5th Stream To entry for RTP <IP address> <port number>.
The IP address and port from the 5th Stream To entry and the Instreamer device's own IP address are dynamically inserted into the livefeed.xml file.
An example of the resulting XML is as follows:
<CiscoIPPhoneExecute>
<ExecuteItem URL="RTPMRx:239.1.1.25:20480"/>
<ExecuteItem URL="http://192.168.11.170/listen.xml"/>
</CiscoIPPhoneExecute>

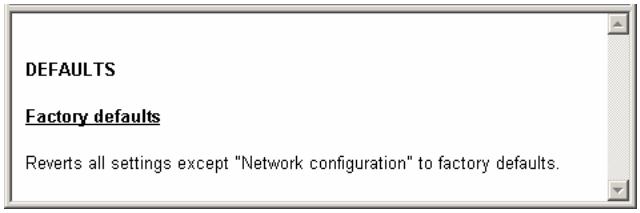
#### listen.xml

The Instreamer Own Name is copied to the Title in the listen.xml file as in the following resulting XML example:
<CiscoIPPhoneText>
<Title>Instreamer_1</Title>
<Prompt>Press Exit to stop listening</Prompt>
<Text>Live audio streaming...</Text>
<SoftKeyItem><Name>Exit</Name>
<URL>SoftKey:Exit</URL>
<Position>1</Position>
<URLDown>RTPRx:Stop</URLDown>
</SoftKeyItem>
</CiscoIPPhoneText>

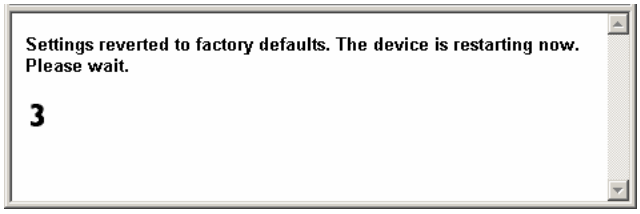
# 4 Reverting to factory defaults

## *Click the CONFIGURATION button.*

Click on the DEFAULTS button to enter the defaults page.
You will see the following screen:




Click on “Factory defaults” to revert all settings except “Network configuration” to factory defaults.
While restarting the device the following screen appears showing a number counting down:




Upon start up the following screen appears stating the successful reverting to factory defaults:

**Hard default settings**

To revert all settings (including the network settings) to factory defaults the “Reset” button has to be pressed for about 5 seconds while the Barix Instreamer is powered.

**Note:** Use this method if a connection to the Barix Instreamer cannot be established.

This can happen if you once have set a SonicIP address, switched off “SonicIP” and then forgotten the IP address.
The Hard default settings sets the IP Address to automatic discovery (0.0.0.0) and enables SonicIP.

If this fails we recommend to download the “Instreamer Rescue Kit” from www.barix.com.
Unzip the Kit and read “readme1st.txt” for instructions.
This Rescue Kit reloads the entire firmware, resets the device to factory default settings using the supplied serial cable and a PC running Windows 2000, Windows XP or Linux.

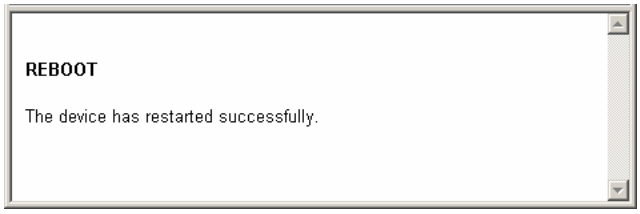
# 5 Rebooting the device

Click the CONFIGURATION button.
Click on the REBOOT button to enter the reboot page.
You will see the following screen:

Click “Reboot the device” to restart the Barix Instreamer.

While restarting the device the following screen appears showing a number counting down:

Upon start up the following screen appears stating the successful restart:



# 6 Rebooting the device

Barix preloads the Instreamer 100 devices with firmware which is current at the day of production.

Barix constantly enhances the capabilities and functions and recommends to keep the firmware on the Barix Instreamer up-to-date.

Barix recommends the use of the “Serial Rescue” method to update the firmware.
For the alternative method “Web Update” the
“Web server port” has to be set to “0” or “80” to work properly (0 will set the default port “80”).

If the web update is interrupted during the process (power or network loss) the device might become unreachable. In that case the “Serial Rescue” procedure is the only remedy. Please keep that in mind when planning a remote update.

## 6.1 Downloading the latest firmware

To download the latest “Instreamer” firmware version please visit www.barix.com.

- In the menu on the left side click on **“downloads”**
- In the center column select select the appropriate device (Instreamer or Instreamer 100) and click on the name of the device.
- Click in the section **“Firmware”** on the “Instreamer Update Kit” link to download it.
- Save the ZIP file and unpack it to a local drive.
-

Read the "_readme1st.txt" file for detailed instructions.

## 6.2 Serial Rescue

The “Serial Rescue” procedure loads the entire firmware and resets the device to factory default settings (current configuration is overwritten).

It is therefore helpful to note the current setting. Printing out the “status” page is the quickest way as the page contains all configuration parameters.
Open your web browser and type in the IP address of the Barix device in the URL field followed by “/status” and hit the “Enter” key.

- Example: “192.168.0.12/status”

To apply the Rescue using a serial cross cable and a PC running Windows 2000, Windows XP, Linux or a MAC follow the steps in the “_readme1st.txt” carefully as there are several different applications (batch files) to be started depending on the Barix hardware (new or legacy) and the PCs COM port number used.

Calculate approximately 2 minutes to complete the
“Serial Rescue” procedure. After a successful rescue the device is ready for configuration according to your needs (see chapter 3 Device Configuration).

## 6.3 Web Update

To apply the “Web Update” procedure you will need a standard web browser and the IP address of the device (announced by the SonicIP feature).

Make sure that the “Web server port” is set to “80” before starting the procedure.
Calculate approximately 2 minutes to complete the
“Web Update” procedure.

**STEP 1**

Open your web browser

**STEP 2**

Type in the IP address of the Barix device and press Enter

- Example: “192.168.0.12”

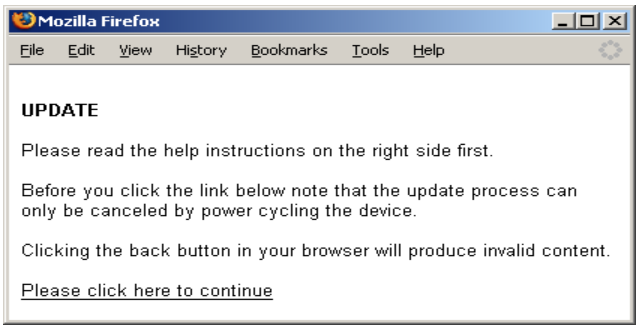
**STEP 3**

Click the CONFIGURATION button.

**STEP 4**

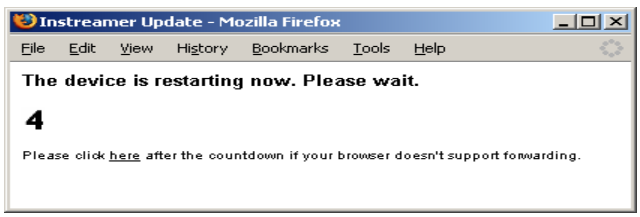
Click on the UPDATE button to enter the update page.

You will see the following screen:

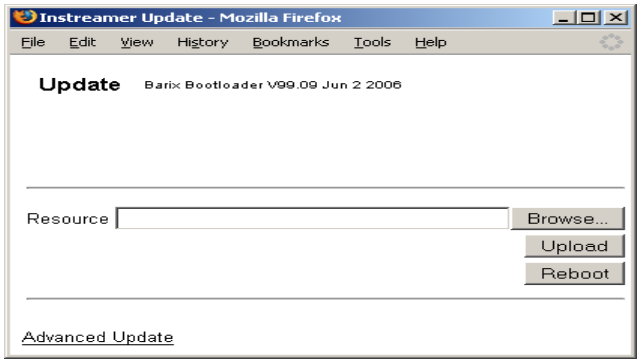

Mozilla Firefox
File Edit View History Bookmarks Tools Help
UPDATE
Please read the help instructions on the right side first.
Before you click the link below note that the update process can only be canceled by power cycling the device.
Clicking the back button in your browser will produce invalid content.
Please click here to continue

**STEP 5**

Click on “Please click here to continue” to launch the update process. The device will restart in a special mode called “Boot loader” and the following screen appears showing a number counting down from 4 to 0.

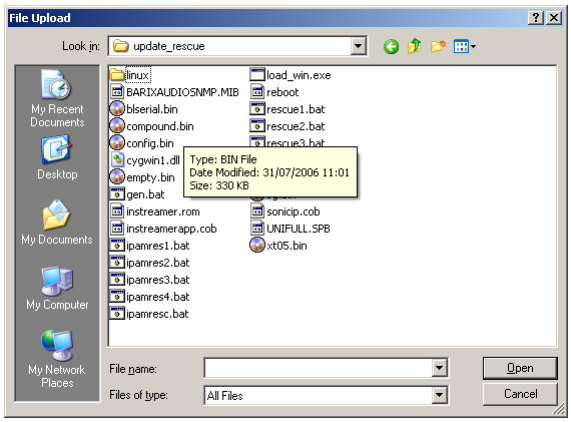

Instreamer Update - Mozilla Firefox
File Edit View History Bookmarks Tools Help
The device is restarting now. Please wait.
4
Please click here after the countdown if your browser doesn't support forwarding.

Upon start up the following screen appears. The Bootloader version and date will most likely be different:




**STEP 6**

Click on "Browse..." to select the file you want to update.

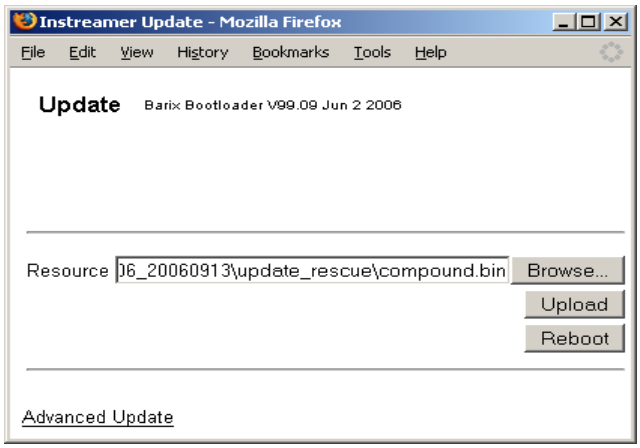



The file is named **compound.bin** located in the folder “update_rescue”.

Select the file and click on the “Open” button.

**STEP 7**

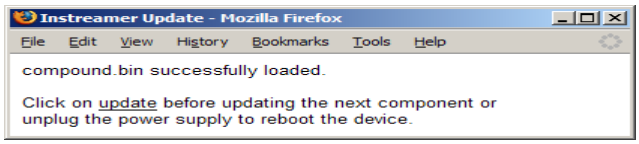
**Attention:** If you load the wrong file the device will not work and the “Serial Rescue Procedure” must be applied!




Click on “Upload” to start the upload process which will take approximately 2 minutes.

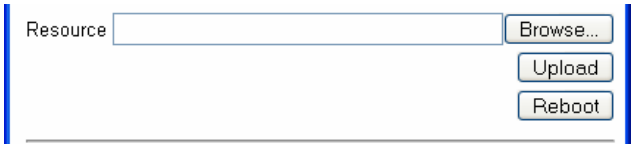
**Warning**:
If the web update is interrupted during the process (power or network loss) the device might become unreachable. In that case the “Serial Rescue” procedure is the only remedy. Please keep that in mind when planning a remote update.

After a successful upload the following window appears:

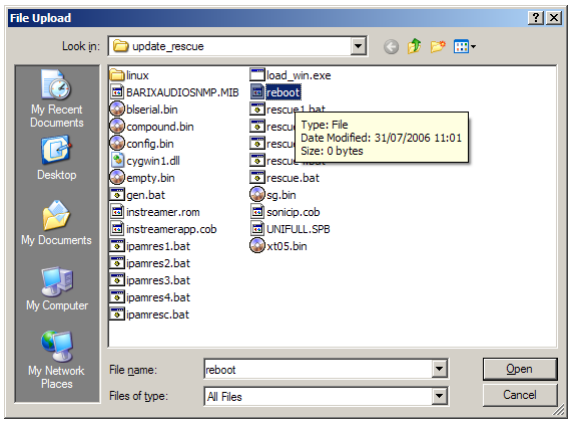

Instreamer Update - Mozilla Firefox
File Edit View History Bookmarks Tools Help
compound.bin successfully loaded.
Click on update before updating the next component or
unplug the power supply to reboot the device.

**STEP 8**

Click on the update link and then click on the "Reboot" button in the following window:




If you do not see the “Reboot” button then click the “Browse” button.



Select the file “reboot” and click on the “Open” button and in the following window click the “Upload” button.

The following screen appears:

Instreamer Update - Mozilla Firefox
File Edit View History Bookmarks Tools Help
rebooting...
Click here to reload the main page.

**STEP 9**

After the device has rebooted click on the “here” link to reload the main page.
The device is now ready for configuration according to your needs (see chapter 3 Device Configuration).

**Note:** The “Web Update” procedure does not change the current configuration. Barix recommends nevertheless checking for correct parameters in the configuration as well as to set parameters for newly added features.
If you observe strange behavior after an update Barix recommends resetting the configuration to factory defaults by keeping the Reset button pressed until the red LED starts blinking (approx. 10 seconds) and to start over with the configuration of the device.

# 7 Dictionary

| | |
|---|---|
| DHCP | Short for Dynamic Host Configuration Protocol, a protocol used to assign an IP address to a device connected to a Network. |
| IP | Short for Internet Protocol, the IP is an address of a computer or other network device on a network using IP or TCP/IP. Every device on an IP-based network requires an IP address to identify its location or address on the network. Example: 192.168.2.10 |
| IPzator | Barix IPzator™ technology is designed for the purpose that the Barix device can create its own IP address according to the network structure in case it can't receive one from your network. If DHCP, AUTOIP or BOOTP fail, IPzator will create an IP address within the subnet and test it. If the address works and is not being used by another device on the network, it will give the address to the Barix device. |
| MAC address | Abbreviation for Medium Access Control, a MAC is a unique address number formatted in hexadecimal format and given to each computer and/or network device on a computer network. Because a MAC address is a unique address a computer network will not have the same MAC address assigned to more than one computer or network device. Example: A1:B2:C3:D4:E5:F6 |
| Netmask | A number used to identify a sub network so that an IP address can be shared on a LAN (Local Area Network).<br>A mask is used to determine what subnet an IP address belongs to. An IP address has two components, the network address and the host address. For example, consider the IP address 150.215.17.009. Assuming this is part of a Class B network, the first two numbers (150.2) represent the Class B network address, and the second two numbers (.017.009) identify a particular host on this network. The Netmask would then be 255.255.0.0 . |
| Ping | Ping is a basic Internet program that lets you verify that a particular IP address exists and can accept requests. Example: ping 192.168.2.10 |
| SonicIP | Barix SonicIP ® technology is designed to vocally announce the Barix devices current IP address. This makes it easier and faster to obtain the necessary network information. To make use of SonicIP plug in the included earphone into RCA audio out, connect the network and plug in the power supply. It will announce the address over the earphones right after power up. |
| Static IP | A Static IP is a fixed IP address that you assign manually to a device on the network. It remains valid until you disable it. |
| Telnet | Telnet is a user command and an underlying TCP/IP protocol for accessing remote computers. On the Web, HTTP and FTP protocols allow you to request specific files from remote computers, but not to actually be logged on as a user of that computer. With Telnet, you log on as a regular user with whatever privileges you may have been granted to the specific application and data on that computer. Example: telnet 192.168.2.10 |

# 8 Legal Information

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All rights reserved.
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